

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of measuring transmission quality of multimedia data, comprising the steps of:

(a) a transmitter transmitting multimedia data through a channel to a receiver in such a way that the transmitter can estimate the multimedia data played at the receiver using information on errors occurring during the multimedia data transmission;

(b) the receiver receiving the multimedia data from the transmitter and transmitting, to the transmitter through a return channel, the information on errors occurring during the multimedia data transmission;;

(c) estimating, at the transmitter, the multimedia data played at the receiver using the error information received from the receiver, and

(d) measuring, at the transmitter, the transmission quality of the multimedia data received by the receiver by comparing the estimated received data with reference data.

2. (Original) The method according to claim 1, wherein the step (b) is performed in such a way as to transmit the error information to the transmitter through the return channel only when a transmission error of the multimedia data is detected.

3. (Original) The method according to claim 1, wherein the step (b) comprises the step of compensating errors by applying an error concealment technique to the received multimedia data.

4. (Original) The method according to claim 3, wherein the step (b) is performed in such a way as to transmit information on the employed error concealment technique and error information to the transmitter through the return channel.

5. (Original) The method according to claim 1, wherein the step (c) is performed in such a way as to estimate the received data using the error information, which is returned from the receiver, and the transmitted multimedia data.

6. (Original) The method according to claim 5, wherein:

at the step (a), the transmitter encodes the multimedia data and transmits the encoded multimedia data through the channel; and

at the step (c), the transmitted multimedia data is obtained by decoding the encoded multimedia data.

7. (Original) The method according to claim 1, wherein the reference data is the transmitted multimedia data.

8. (Original) The method according to claim 7, wherein:

at the step (a), the transmitter encodes the multimedia data and transmits the encoded multimedia data through the channel; and

at the step (c), the transmitted multimedia data is obtained by decoding the encoded multimedia data.

9. (Original) The method according to claim 1, wherein the step (d) is performed in such a way as to estimate the transmission quality by using any one of a full-reference method, a reduced-reference method, and a no reference method.

10. (Original) The method according to claim 1, further comprising the step of, after the step (d):

(e) selectively maintaining or changing a transmission state of the multimedia data through the channel depending on the evaluation result of transmission quality.

11. (Original) The method according to claim 10, wherein the step (e) is performed in such a way as to perform at least one of operations of terminating video transmission, increasing the channel bandwidth, employing an error correction technique, and switching to another CODEC robust against channel errors depending on evaluation results of transmission quality so as to change the transmission state.

12. (**Currently Amended**) An apparatus for measuring transmission quality of multimedia data, comprising:

a transmitter transmitting multimedia data through a channel to a receiver in such a way that the transmitter can estimate the multimedia data played at the receiver using information on errors occurring during the multimedia data transmission; and

~~a-the receiver receiving the multimedia data, detecting errors, which occurs in the channel, from the multimedia data, and transmitting the information on detected errors to the transmitter through a return channel, wherein the transmitter comprises,~~

~~an encoding unit encoding source multimedia data to encoded multimedia data,~~

~~an estimation unit estimating the received multimedia data played at the receiver using the returned error information, and~~

~~an evaluation unit evaluating the transmission quality of the received data by comparing the estimated received data with reference data.~~

13. (Original) The apparatus according to claim 12, wherein the receiver transmits error information to the transmitter through the return channel only when an error occurs in the channel.

14. (Original) The apparatus according to claim 12, wherein the receiver includes means for compensating errors by applying an error concealment technique to the received multimedia data.

15. (Original) The apparatus according to claim 14, wherein the receiver transmits information on the error concealment technique and the error information to the transmitter through the return channel.

16. (Original) The apparatus according to claim 12, wherein the estimation unit estimates the received data using the returned error information and transmitted multimedia data.

17. (Original) The apparatus according to claim 16, wherein the transmitter further comprises: a decoding unit decoding encoded multimedia data and outputting the transmitted multimedia data.

18. (Original) The apparatus according to claim 12, wherein the reference data is the transmitted multimedia data.

19. (Original) The apparatus according to claim 12, wherein the evaluation unit estimates the transmission quality using any one of a full-reference method, a reduced-reference method, and a no reference method.

20. (Original) The apparatus according to claim 12, wherein the transmitter further comprises:

a control unit for selectively maintaining or changing a transmission state of the multimedia data through the channel depending on the evaluation result of transmission quality.

21. (Original) The apparatus according to claim 20, wherein the control unit performs at least one of operations of terminating video transmission and increasing the channel bandwidth, depending on evaluation results of transmission quality.

22. (Original) The apparatus according to claim 20, wherein the encoding unit performs at least one of operations of applying an error correction technique and switching to another CODEC robust against channel errors depending on evaluation results of transmission quality.

23. (Previously Presented) A method of measuring transmission quality of multimedia data, comprising the steps of:

- (a) transmitting multimedia data through a channel by a transmitter;
- (b) transmitting a set of parameters extracted from a video segment which are affected by errors occurring during multimedia data transmission to the transmitter through a return channel by a receiver receiving the multimedia data from the transmitter;
- (c) measuring the transmission quality of the received multimedia data played at the receiver by using the set of parameters and reference data by the transmitter.

24. (Previously Presented) An apparatus for measuring transmission quality of multimedia data, comprising:

- a transmitter transmitting multimedia data through a channel; and
- a receiver receiving the multimedia data, detecting errors, which occurs in the channel, from the multimedia data, and extracting a set of parameters from a video segment which are affected by the errors the transmitter through a return channel, wherein the transmitter comprises,
- an encoding unit encoding source multimedia data to encoded multimedia data, and
- an evaluation unit evaluating the transmission quality of the received multimedia data played at the receiver by using the set of parameters and reference data.